<u>WHAT IS CLAIMED IS:</u>

1   1.   A data storage system comprising:

2   an input part which receives performance requirement parameters concerning

3   storage performance for each of a plurality of data storage areas within the data storage

4   system;

5   a first comparing part which compares the performance requirement

6   parameters with actual storage performance variables;

7   a first detection part which detects at least one data storage area where the

8   actual storage performance variables do not satisfy the performance requirement parameters;

9   and

10   a migration part which migrates data stored in the data storage area detected

11   by the first detection part to another storage area.

       2.   The system of claim 1, further comprising:

       a calculation part which calculates an average of the actual storage

       performance variables per unit time;

       a second comparing part which compares the average and the performance

       requirement parameters; and

       a second detection part which detects a data storage area where the average

       per unit time does not satisfy the performance requirement parameters.

1   3.   The system of claim 1, wherein the storage performance is determined

2   by at least one of the following:

3   I/O accessibility;

4   data transfer volume;

5   disk free space rate;

6   disk busy rate;

7   data transfer speed; and

8   an amount of cache resident data.

1   4.   The system of claim 2, wherein the storage performance is determined

2   by at least one of the following:

3   I/O accessibility;

4   data transfer volume;

5   disk free space rate;

6   disk busy rate;

7   data transfer speed; and

8   an amount of cache resident data.

1   5. The system of claim 1, wherein the migration part performs the

2 following steps:

3   staging data into cache;

4   creating a mirror disk;

5   varying data redundancy; and

6   transferring data from one physical volume to another physical volume.

1   6. A method for providing data storage service, the method comprising:

2   making a service level agreement concerning a requirement for storage

3 performance;

4   setting performance requirement parameters in accordance with the service

5 level agreement;

6   monitoring an actual storage performance variable; and

7   reallocating data stored in a data storage area where the actual storage

8 performance variable does not satisfy the performance requirement parameters.

1   7. The method of claim 6 further comprising the steps of:

2   calculating an average of the actual storage performance variables per unit

3 time; and

4   refunding a charge paid by a contractor who used the data storage area where

5 the average did not satisfy the performance requirement parameters, the charge being paid in

6 accordance with the service level agreement.

1   8. The method of claim 7 further comprising the step of reporting the

2 actual storage performance variables to the contractor.

1   9. A method for providing data storage services comprising:

2   making a service level agreement including requirements for storage

3 performance;

4   setting performance requirement parameters in accordance with the service

5 level agreement;

6   monitoring actual storage performance variables; and

7   reallocating the data stored in a data storage area when the actual storage

8   performance variables do not satisfy the performance requirement parameters.

1   10.   The method of claim 9, wherein the performance requirement

2   parameters are associated with each of the data storage areas, and a charge for data storage is

3   determined in accordance with the performance requirement parameters.

1   11.   The method of claim 10 further comprising:

2   calculating an average of the actual storage performance variables per unit

3   time;

4   identifying the data storage area where the actual storage performance

5   variables does not satisfy the performance requirement parameters; and

6   outputting information about the designated data storage area to enable

7   refunding a charge of data storage.

1   12.   The method of claim 6, wherein the data reallocation comprises:

2   staging the data into cache;

3   creating a mirror disk;

4   varying data redundancy; and

5   transferring data from one physical volume to another physical volume.

1   13.   The method of claim 10, wherein the step of reallocating the data

2   comprises:

3   staging data into a cache;

4   creating a mirror disk;

5   varying data redundancy; and

6   transferring data from one physical volume to another physical volume.

1   14.   A method for allocating data storage area within a system comprising

2   of storage device and storage controller, the method comprising the steps of:

3   setting performance requirement parameters for the storage controller, the

4   performance requirement parameters associated with each of a plurality of data storage areas;

5   monitoring access frequency for the data storage areas; and

6   reallocating data stored in a data storage area where the access frequency does

7   not satisfy the performance requirement parameters.

1   15.   The method of claim 14 further comprising the steps of:

2   charging for the data storage, the charge being determined in accordance with

3   the performance requirement parameters; and

4   reducing the charge if the performance requirement parameters are not

5   satisfied, the reduction being made in accordance with a length of time while the performance

6   requirement parameters are not satisfied.

1   16.   The method of claim 14 wherein the storage performance is

2   determined by at least one of the following:

3   I/O accessibility;

4   data transfer volume;

5   disk free space rate;

6   disk busy rate;

7   data transfer speed; and

8   an amount of cache resident data.

1   17.   The method of claim 16, wherein the data reallocation comprises:

2   staging the data into cache;

3   creating a mirror disk;

4   varying data redundancy; and

5   transferring data from one physical volume to another physical volume.

1   18.   A method of managing a data storage system accessed via a network,

2   wherein the system is comprised of a network connected server, and a data storage system

3   connected to the server, the method comprising:

4   receiving at least one performance requirement parameter indicating system

5   performance desired by a contractor, wherein each performance requirement parameter

6   received to the data storage system is associated with a particular data storage area;

7   checking actual storage performance by referring to the performance

8   requirement parameter; and

9   migrating data stored in the data storage area if the actual storage performance

10   does not satisfy the performance requirement parameter.

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